

Work Order ID 67211



Page 1

Thursday, March 10, 2011 2:31:38 PM

Item ID: D407-667-205

Accept



Setup Start



Revision ID:

Stop



Item Name: Crosstube Aft

Start Date: 3/10/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 3/18/2011 Req'd Qty: 1.00



Customer:

Reference:

Approvals:

Process Plan:

Handwritten signature

Date: 11-03-10

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Run Start



Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Draw Nbr	Revision Nbr
D407-667-245	Rev F

100

0.00



DOCUMENT CONTROL

DC

Memo

0.00

Document Control

Photocopy bluefile and create labels as per PPP D407-667-205 CH0006

Handwritten: Dulwich

Handwritten: CL 11-4-21

Handwritten: CH6457 Per PS 29550

110

0.00



Pick Kit

Packaging

Packaging

Memo

0.00

Packaging

Handwritten signature

Handwritten: 11-3-31

120

0.00



BENDING MACHINE - CROSSTUBES

CNC Bend 1

Memo

0.00

CNC Delta 100 Bender

I-Bend tube as per Dwg D407-667-245 using CNC bender program 407 Aft and Folio 21

Handwritten signature

Handwritten: 11-3-31

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
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Customer:

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Run Start



Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Stop



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

130

QC15- Crosstube Dimensional Check

0.00



QC

Memo

0.00

8.663/31

(XU)

Quality Control

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Stop



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
140 Crosstubes	Crosstubes	0.00							
Crosstubes	Memo 1-Drill pilot holes in tube using drill Jig DT8583 & DT8584 as per Dwg D407-667-245. Drill all (3) top holes. 2-Drill and Ream all holes in tube to finish size using drill Jig DT8583 & DT8584 as per Dwg D407-667-245. Check dimensions between holes on all four sides. 3-Flip tube and switch drilling Jigs from right to left, left to right. Locate Jigs off existing holes using "T" pins. 4-Drill pilot holes using drill Jig DT8583 & DT8584 as per Dwg D407-667-245. Drill only the top (2) holes. 5-Drill & ream the top (2) holes to finish size using drill Jig DT8583 & DT8584 as per Dwg D407-667-245. 6-Drill Aft rivet holes using drill Jig DT8789 as per Dwg D407-667-245. Note: Aft side has 3x top holes. 7-Drill Fwd rivet holes using drill Jig DT8789 as per Dwg D407-667-245. Drill only the top (3) holes. 8-C'sink holes as per Dwg D407-667-245. Allow rivet to sit below surface to compensate for paint. 9- Scribe tube to identify on the inner chamfer in the cuff D# and B# 10-Debur & Inspect for surface damage. Repair damage within limits as per	0.00							

SAD 11-04-01

SAD 11-04-01

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Reference:

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Process Plan:

Date:

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

Dwg D407-667-245

150

Crosstubes Chemical Conversion

0.00



HandFXtube

Memo

0.00

Hand Finishing Crosstubes

11-4-4

160

QC3- Inspect Part Finish

0.00



QC

Memo

0.00

Quality Control

170

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

180	Outsource process - NDT per QSI038 4.1	0.00							
-----	--	------	--	--	--	--	--	--	--



Outsource2

Memo 0.00

Outsource process - NDT

Liquid Penetrant Inspection as per QSI 0380
Issue P/O: 13801 LPI as per ASTM 1417
Level 2 Attach copy of NDT results to work order

CY 11/04/05 (1)

190	Packaging	0.00							
-----	-----------	------	--	--	--	--	--	--	--



Packaging

Memo 0.00

Packaging

Ensure copy of NDT results attached to work order.

11/04/05 (1)

200	QC5- Inspect part completeness to step on W/O	0.00							
-----	---	------	--	--	--	--	--	--	--



QC

Memo 0.00

Quality Control

11 04 05 (1)

W/O:		WORK ORDER CHANGES					
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Reference:

Cust Item ID:

Customer:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start

Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

210



SprayPaint

Spray Painting

SprayPaint

Memo

1-Prime inside and outside crosstube as per QSI 005 4.2
2-Paint outside crosstube with White Imron as per QSI 005 4.2

PRIME:

Start Time: _____

Finish Time: _____

11-04-12

PAINT:

Start Time: _____

Finish Time: _____

11-04-13

0.00

0.00

85 11-04-13



220



QC

Quality Control

QC14- Inspect Spray Paint

Memo

Then, Wrap in plastic bag to protect from scratches

0.00

0.00

m 11 04 14 ①

W/O: 67211		WORK ORDER CHANGES						
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector	
11-04-12	210	<ul style="list-style-type: none">- prime entire outside surface of tube allow 4hrs flash time (using tempo epoxy primer)- clear coat inside surface of tube using Imron 2.1-HG-C as per manufacturer's specs (coat inside of tube slightly wider than 2" wide and 2" away from cuffs)	BT	11-04-13	1	11-04-13	11-04-14	
11-04-12	210	<ul style="list-style-type: none">- allow to dry over night- mask off inside of tube 2" wide + 2" away from each cuff (inspection window) scuff exposed primer using scotchbrite + paint using Imron 333 white	BT	11-04-13	1	11-04-13	11-04-14	

Part No: D407-667-205 PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run Start



Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

230

0.00



Crosstubes

0.00

Crosstubes

Memo

1-Install abrasion strips as per QSI 035 using DT8674. Install chafing shield as per Dwg D407-667-245. Note: (3) top holes should be facing up.

2- Lightly scuff the bonded area using a 320 grit sand paper and clean the area with 41058 wash 'n' wipe

3-Install support with magnobond and install clamps as per Dwg D407-667-245 using installation jig DT9025. Torque clamps to 80-100 in lb

A/R Magnobond Batch: 116677
EXP: 11/08

4-Install nut plates as per Dwg D407-667-245. Touch-up rivet heads with Inuron paint.

25 11-04-19
P10

240

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

11 04 21

W/O: 67211		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
11-04-14	230	install chafing shields using Pro Seal P/S 890 B-2 m 117395	RE	11-04-19	1	11-04-14 OS1062	11-04-21

Part No: D407-667-205 PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

250

Pick Kit

0.00



Packaging

Memo

0.00

Packaging

11/4/21 SP

260

QC4- 100% Inspect kits for completeness

0.00



QC

Memo

0.00

Quality Control

Sulzer 121

60

270

Packaging

0.00



Packaging

Memo

0.00

Packaging

Identify and in kanban rack
Location: 53

Leuf

11/4/21 SP

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
280	QC21- Final Inspection - Work Order Release	0.00							
QC	Memo	0.00							
Quality Control									

ME
11-04-20

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Picklist Print

Thursday, March 10, 2011 2:31:44 PM

Page 1

Work Order ID: 67211

Parent Item: D407-667-205

Parent Item Name: Crosstube Aft



Start Date: 3/10/2011

Required Date: 3/18/2011

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:C 05.09.02 Add holes for compatibility with Bell Skidtubes KJ/JLM
IPP Rev:D Added Magnobond, Rubber Cushion & Clamps 07-02-19
JLM

****CHANGE TO CHG 005 - IF USING D2894-1 B35578 OR GREATER****
IPP Rev:E 08-05-22 add comment in seq. 6 and QC15 and QC5 DD verified
by:EC
IPP Rev:F 08-06-12 add comment in seq. 24 DD verified by:EC
IPP Rev:G 08-08-19 revE as per dwg DD verified by:EC
IPP Rev H 09.01.06 ECN 08-562 EC verified by:DD IPP Rev:I
10.04.07 revise route seq. in bom DD verified by:JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D407-667-205TRN		Manufactured	No			110	Each	4.0000	1	1			
Crosstube Turning Detail													

Location	Loc Qty	Loc Code
LG	4	
66263	1	
66264	1	
66265	1	
66266	1	

⑤ ①

AN960JD516 NAS1149D0563J Purchased No

230 Each 34.0000 18

Washer

Location	Loc Qty	Loc Code
ST298	34	
103694	18	
107534	12	
109287	4	

1117291 11/4/15

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Parent Item Name: Crosstube Aft

Start Date: 3/10/2011

Required Date: 3/18/2011

Start Qty: 1.00

Required Qty: 1.00

D2856-400 Manufactured No

230 f

146.2980 1.288 1.355789



Abraison Strip

*N/A as per
Pto @ shop
230*

Location

Loc Qty

Loc Code

ST403

146.2980421

56626

0.00004211

59920

43.381

63735

102.917

D2873-043 Manufactured No

230 Each

18.0000 2 2



Nut Plate Assembly

66898

Location

Loc Qty

Loc Code

LG

16

65375

16

ST

2

60981

2

D2873-045 Manufactured No

230 Each

36.0000 2 2



Nut Plate Assembly

BT 11-04-20

BT 11-04-20

Location

Loc Qty

Loc Code

LG

36

60982

4

63498

1

65132

11

65992

20

x2

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Start Date: 3/10/2011

Required Date: 3/18/2011

Start Qty: 1.00

Required Qty: 1.00

D2894-1 Manufactured No

230 Each

10.0000

1

1



2.750 Support



25 11-04-19

Location

Loc Qty

Loc Code

LG

10

43713

3

43881

7

XC

D3190-1 Manufactured No

230 Each

20.0000

2

2



Chafing Shield



25 11-04-19

Location

Loc Qty

Loc Code

LG

20

58569

20

XC

D3595-063-450 Manufactured No

230 Each

73.4590

2

2



RUBBER CUSHION



25 11-04-19

Location

Loc Qty

Loc Code

LG

68.45897368

53775

5.97897368

58161

3.56

59580

0.12

61465

4.68

63960

10

65656

2.12

67067

42

ST415

5

64171

4

64300

1

W/O:		WORK ORDER CHANGES					
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Parent Item: D407-667-205

Parent Item Name: Crosstube Aft

Start Date: 3/10/2011

Required Date: 3/18/2011

Start Qty: 1.00

Required Qty: 1.00

MS20601-AD4W8

Purchased

No

230

Each

282.0000

14

14



RIVET



11-04-20

Location

Loc Qty

Loc Code

LG

178

116119

78

117106

100

ST322

104

112203

104

14

MS21920-22

Purchased

No

230

Each

48.0000

4

4



Clamp(per MIL-DTL-8783C)



11-04-19

Location

Loc Qty

Loc Code

LG

48

114077

2

116207

46

14

MS21920-25

Purchased

No

230

Each

88.0000

2

2



Clamp(per MIL-DTL-8783C)



-24

1104550

PTO

Location

Loc Qty

Loc Code

LG

63

113281

0

114759

5

114901

3

115278

1

115849

12

116264

42

ST451

25

109181

1

113281

5

113282

18

113744

1

Thursday, March 10, 2011 2:31:45 PM

Shop Packet Print

Page 4

W/O: 67211		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
11-04-20		use MS21920-24 clamps - 25 no more stock -26 too long	ET	11-04-20	1	1.04.21	

Part No: D407-667-205 PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Start Date: 3/10/2011

Required Date: 3/18/2011

Start Qty: 1.00

Required Qty: 1.00

AN5-10A

Purchased

No

250

Each

210.0000

10

10



Bolt



11/4/218

Location

Loc Qty

Loc Code

ST337

210

115589

50

115700

10

116704

50

116924

50

117010

50

10

AN5-32A

Purchased

No

250

Each

131.0000

4

4



Bolt



4

Location

Loc Qty

Loc Code

ST340

131

115016

21

115108

50

115589

60

4

AN5-34A

Purchased

No

250

Each

80.0000

4

4



Bolt



11/4/218

Location

Loc Qty

Loc Code

ST340

80

115835

20

116003

20

116704

20

117010

20

4

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist Print

Thursday, March 10, 2011 2:31:45 PM

Page 6

Work Order ID: 67211



Parent Item: D407-667-205



Parent Item Name: Crosstube Aft

Start Date: 3/10/2011

Required Date: 3/18/2011

Start Qty: 1.00

Required Qty: 1.00

MS21042L5

Purchased

No

250

Each

970.0000

4

4



Nut



11/4/218

Location

Loc Qty

Loc Code

ST139

26

114813

26

ST300

944

115594

248

116105

496

116548

200

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

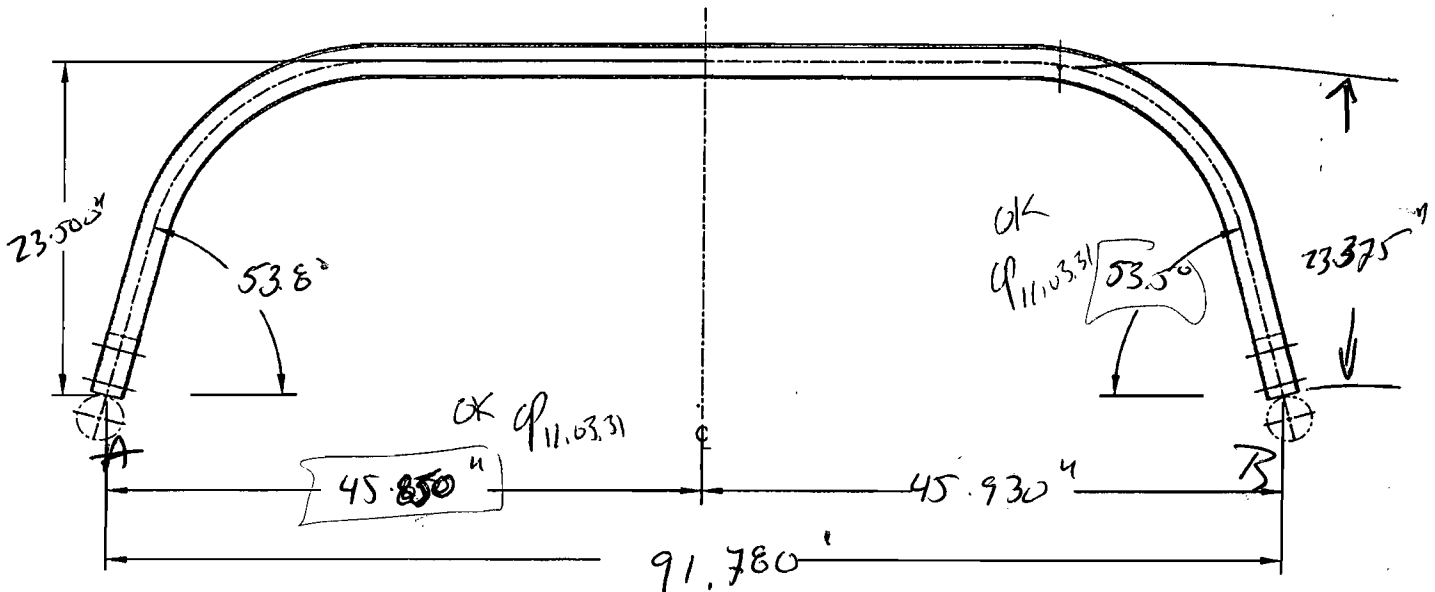
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NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DART AEROSPACE LTD	Work Order:	4724
Description: Crosstube High Aft (407)	Part Number:	D407-667-205
Inspection Dwg: D407-667-245 Rev: F		Page 1 of 1

Required Dimension	Min	Max
Height	23.46	23.58
1/2 Span	45.86	45.98
Angle	54	56
Total Span	91.72	91.96



Comments
width is narrow and angles under tolerance.
Acceptable 11.03.31

QC15 Inspection	5
Date	11/03/31

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	09.06.22	Dwg Rev updated	KJ	

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Item	QTY -245	PART NUMBER	DESCRIPTION
1	X	D407-667-245	CROSSTUBE ASSEMBLY (407 HIGH AFT)
2	1	D6011-115	CROSSTUBE
3	2	D2856-400-773	ABRASION STRIP
4	2	D2873-043	NUT PLATE
5	2	D2873-045	NUT PLATE
6	1	D2894-1	SUPPORT
7	2	D3190-1	CHAFING SHIELD
8	2	D3595-063-430	RUBBER CUSHION
9	14	MS20601AD4W8	RIVET (OR NAS9302B-4-8)
10	4	MS21920-22	CLAMP
11	2	MS21920-25	CLAMP (OR MS21920-24)
12	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947- 100, TYPE II, CLASS 2 ADHESIVE)

GENERAL NOTES:

- MATERIAL: MANUFACTURED FROM D6011-115
FINISHED LENGTH = 112.91±0.020
- FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- UNITS: INCHES UNLESS OTHERWISE NOTED.
- BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- IDENTIFICATION: SCRIBE DART PART NUMBER "D407-667-245" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- WEIGHT: 27.7 lbs
- PART IS SYMMETRIC ABOUT CENTERLINE.
- RUN-OFF PART. BLEND OUT EDGE LONGITUDINALLY. TRANSITION SHOULD BE SMOOTH.
- BEND PROGRESSIVELY WITH A MINIMUM OF 6 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- INSTALL D2894-1 CENTER SUPPORT USING A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- INSTALL MS21920-25 CLAMPS WITH D3595-063-430 RUBBER CUSHIONS TO SECURE D2894-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE CROSSTUBE SUPPORT.
NOTE: MS21920-24 CLAMPS CAN BE USED TO ACCOMMODATE VARYING DIAMETERS. ENSURE THERE IS A MINIMUM OF 1.5 THREADS IN SAFETY ON THE NUTS.
- EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- INSTALL D2856-400-773 ABRASION STRIP WITH A 0.13 (REF) GAP ON BOTTOM SIDE OF CROSSTUBE, PER QSI 035.
- INSTALL D3190-1 CHAFING SHIELDS SO THAT OVERLAP IS ON BOTTOM SIDE OF CROSSTUBE OPPOSITE D2894-1 SUPPORT.
- TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

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SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 6724
2811-03-10

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[Signature]

F	REFORMAT NOTES TO NEW STANDARDS (ZN B8-1); RELOCATED FLAG # 6 (ZN A8-3) PER NOR 210; REMOVED REF. & ADD TOLERANCES (ZN C6-3, C4-3 & D2-3)	RF	08.11.06
E	8.02 AND 8.53 WERE 8.40 AND 8.90 (ZN D5-2); REORGANIZED VIEWS AND REFORMATED DRAWING TO CURRENT STANDARDS. REASONS: CLAMPS MOVED 0.375 TOWARD CL TO ELIMINATE INTERFERENCE WITH AIRCRAFT MOUNTS. REFERENCE: PAR#08-21 AND ECR#1225	MB	08.07.24
D	ADD VIEW FOR OEM SKID HOLES, ROTATE ORIENTATION OF CLAMPS SECTION F-F, REMOVE -851 ABRASION STRIP, ADD MAGNOBOND 6398, ADD CUSHION	PH	07.02.07
C	ADD HOLES AND NUT PLATES FOR COMPATIBILITY WITH BHT/AA SKIDTUBES	PH	05.07.26
B	ADD CHAFING SHIELD	CP	03.05.21
A	NEW ISSUE	CP	02.05.13
REV.	DESCRIPTION	BY	DATE
DESIGN	<i>[Signature]</i>		
DRAWN	RF		
CHECKED	<i>[Signature]</i>		
MFG. APPR.	<i>[Signature]</i>		
APPROVED	<i>[Signature]</i>		
DE APPR.	<i>[Signature]</i>		
DATE	08.11.06		

DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWING NO. D407-667-245	REV. F SHEET 1 OF 4
TITLE CROSSTUBE ASSY (407 HIGH AFT)	SCALE NTS
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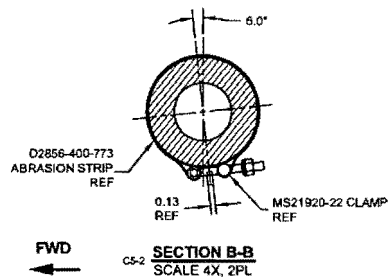
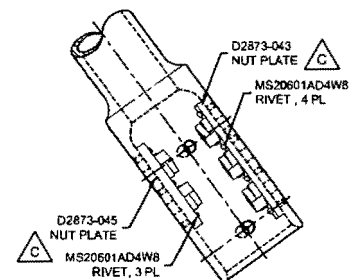
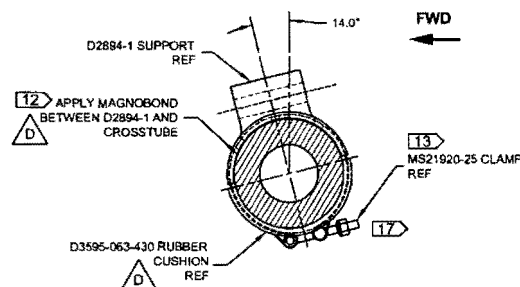
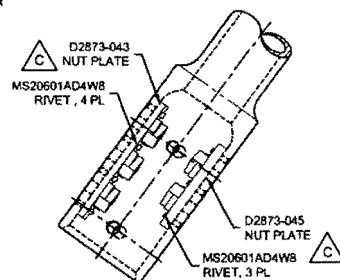
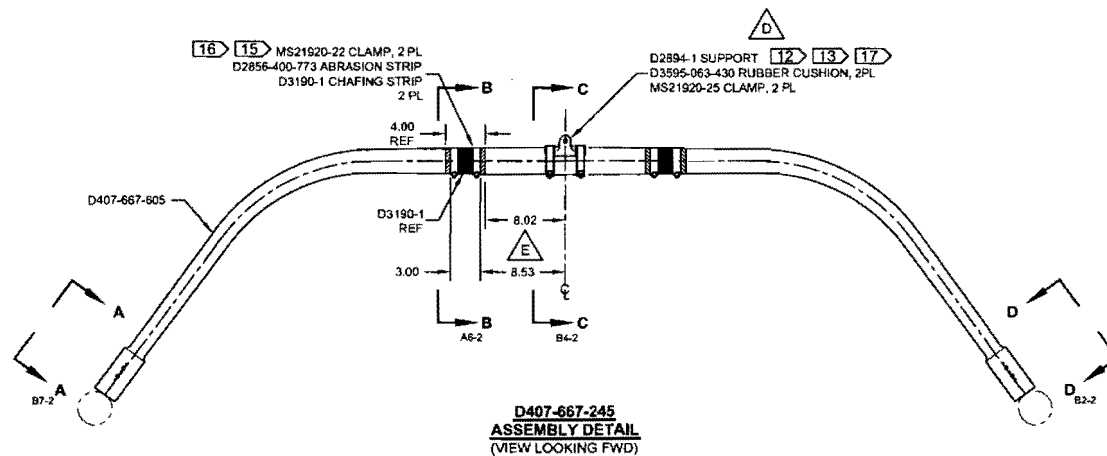
W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



w/o 6721

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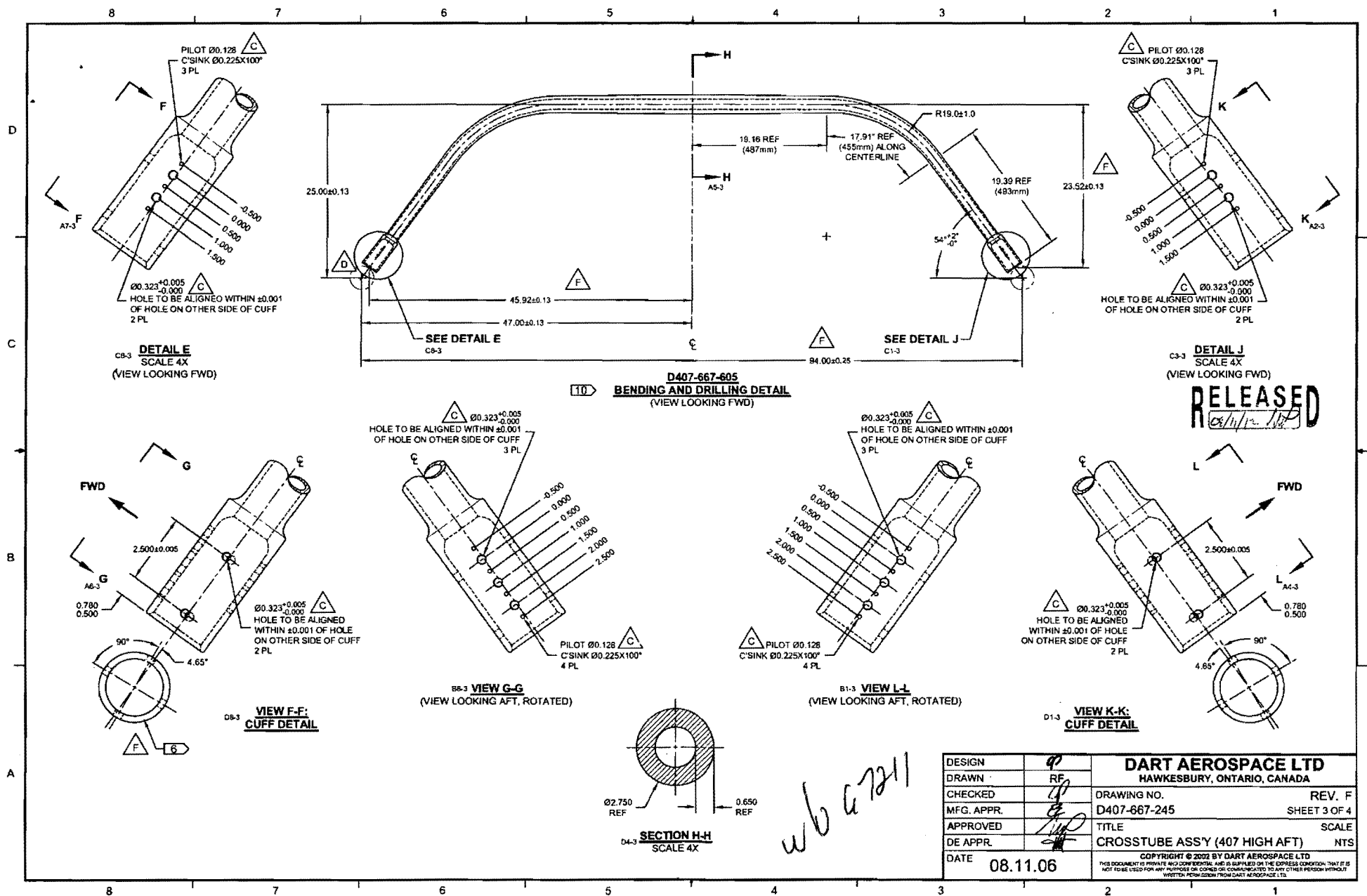
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DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

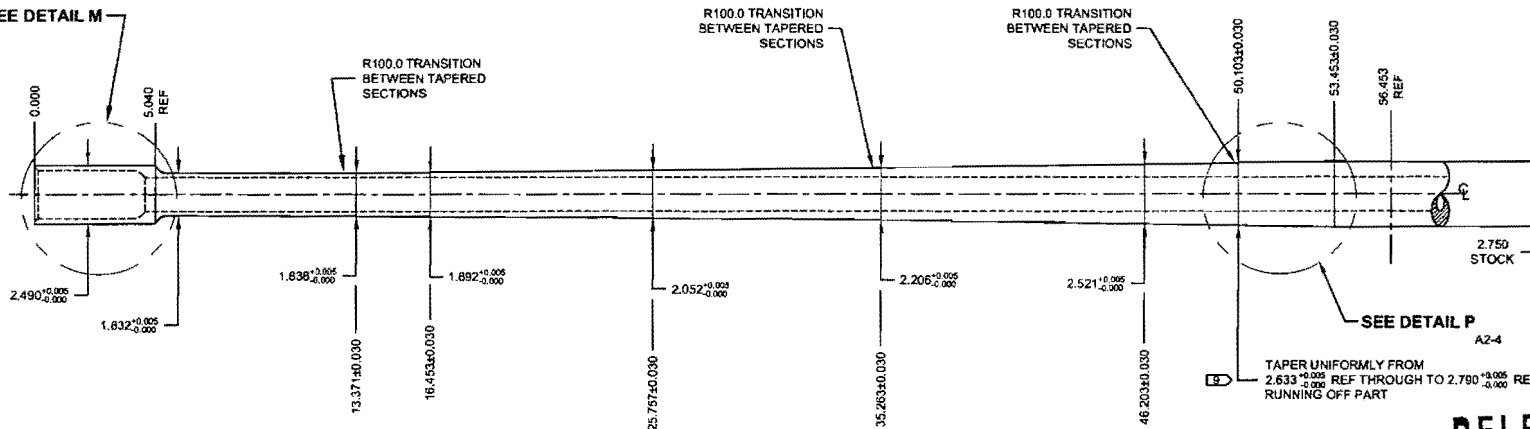
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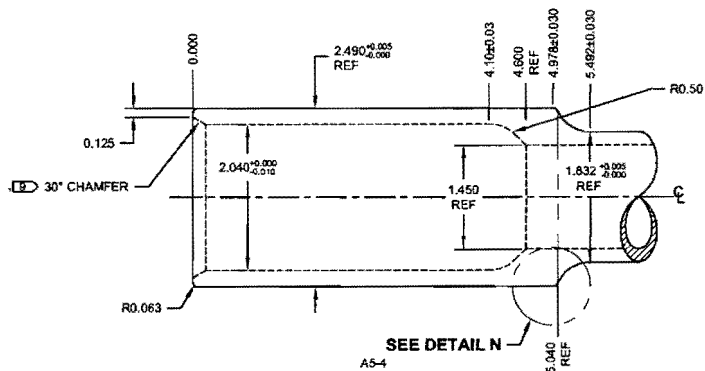
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DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

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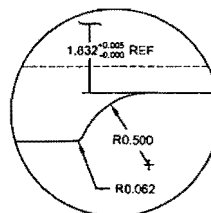
SEE DETAIL M
A7-4



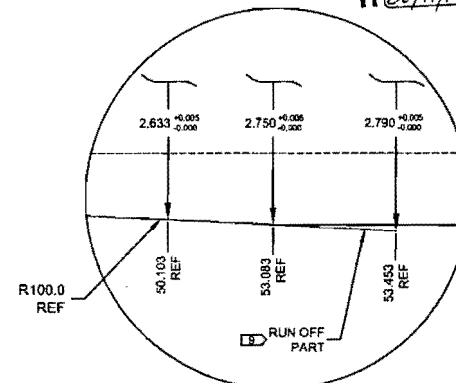
D407-667-245 MACHINING DETAIL



DETAIL M: CROSSTUBE CUFF
SCALE 3X



DETAIL N: CUFF TRANSITION
SCALE 2X



DETAIL P: TAPER RUN-OFF
NOT TO SCALE

RELEASED
08/11/12

u/b 67241

DESIGN	0	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	0	DRAWING NO.	REV. F
MFG. APPR.	0	D407-667-245	SHEET 4 OF 4
APPROVED	0	TITLE	SCALE
DE APPR.	0	CROSSTUBE ASS'Y (407 HIGH AFT)	NTS
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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DART SERVICE INSTRUCTION

TO AMEND INSTALLATION INSTRUCTIONS IIN-D206-667 Rev. C AND
INSTRUCTIONS FOR CONTINUOUS AIRWORTHINESS ICA-D206-667 Rev. 2

REF. CANADIAN STC: SH01-5

REF. FAA STC: SR01304NY

REF. EASA STC: EASA.IM.R.S.01179

REFERENCE ONLY

For D407-667-205 High Aft Crosstube at CHG 007 or later, an inspection window has been added on the underside of the crosstube to facilitate inspection.

IMPORTANT NOTE: If a D407-667-205 Crosstube was stripped of paint, it should now be refinished as follows:

- 1) Apply chemical conversion film material (Alodine 1200 or 1201) per MIL-C-5541 and one coat of MIL-P-85582 or MIL-P-23377 primer.
- 2) Mask underside of crosstube as per hatched area shown in Figure 1.
- 3) Paint outside surfaces of crosstube by applying 2-3 coats of MIL-C-85285 polyurethane paint to match original finish.
- 4) Apply clear coat on inspection window (hatched area).

Additionally, for D407-667-205 High Aft Crosstube at CHG 007 or later, the D2856-400-773 Abrasion Strips have been removed and the D3190-1 Chafing Shields have been bonded onto the crosstube using Proseal 890. For D407-667-205 High Aft Crosstube at CHG 007 or later, amend Parts List of IIN-D206-667 Section 5.0 and ICA-D206-667 Section 32.8 as follows:

Remove:

Item	QTY -205	Part Number	Description
14	*2	D2856-400-773	ABRASION STRIP

If a D3190-1 Chafing Shield is being re-installed on the crosstube, it should now be re-installed as follows:







- 1) Follow section 32.1 of ICA-D206-667 for the removal of the crosstubes from the helicopter.
- 2) Remove the qty(2) MS21920-22 Clamps from the crosstube that fasten each D3190-1 Chafing Shield to the crosstube.
- 3) Remove the D2856-400-773 Abrasion Strips from the crosstube per section 32.5 of ICA-D206-667.
- 4) Inspect the crosstube surface where the chafing shields and abrasion strips were installed for corrosion and mechanical damage per items 5.3.1 and 5.3.2 of the 300 hour inspection. Repair damage within acceptable limits per item 5.3.3 of the 300 hour inspection. Touch up finish per item 5.3.9 of 300 hour inspection. If crosstube was stripped of paint, refer to above instructions for suitable refinishing of crosstube.
- 5) Apply a 0.02" to 0.04" (0.5-1.0 mm) thick layer of Proseal 890 on the concave surface of D3190-1 Chafing Shields and let cure per manufacturer's instructions.
- 6) Once the Proseal on the D3190-1 Chafing Shields is cured, apply a thin layer of Proseal 890 on the crosstube to cover the area where the Chafing Shields will be installed.
- 7) Locate the D3190-1 Chafing Shield as shown in Figure 2. Ensure that the overlapping edge of the chafing shield is located at approximately 60° from bottom vertical to prevent deterioration of the rubber bumpers. Be sure to eliminate any air gaps.
- 8) Position and tighten the clamps to a torque of 80-100 in-lb (9.0-11.3 N-m).
- 9) Allow the assembly to cure for 12 hours.
- 10) Re-install the D407-667-205 crosstube per section 32.2 of ICA-D206-667.

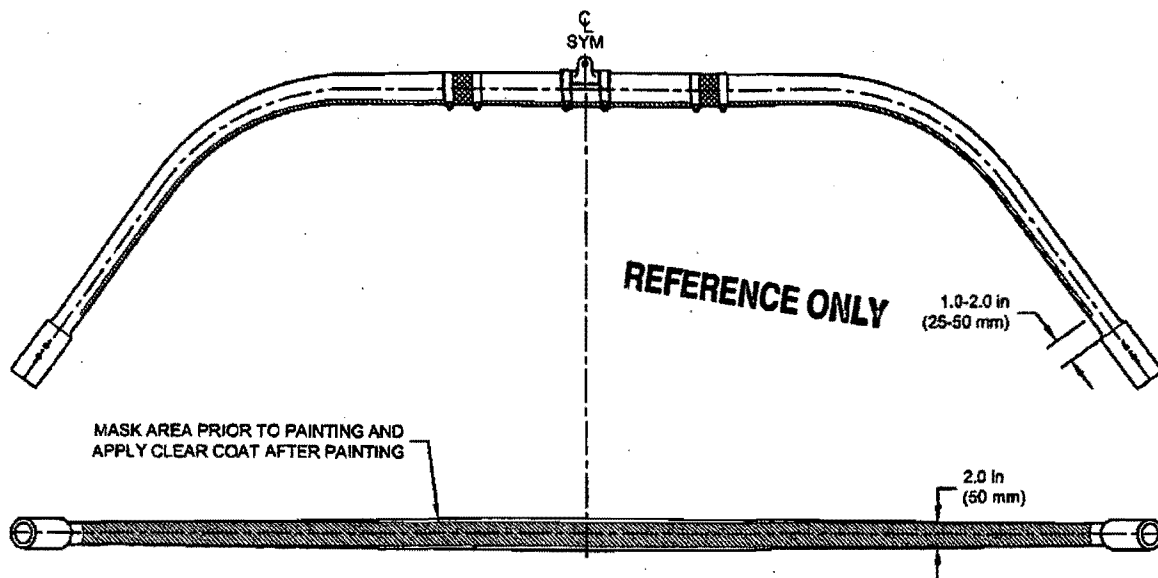
CANADA
DEPARTMENT OF TRANSPORT
AIRCRAFT CERTIFICATION
BRANCH
DAO # 01-O-01

APPROVED

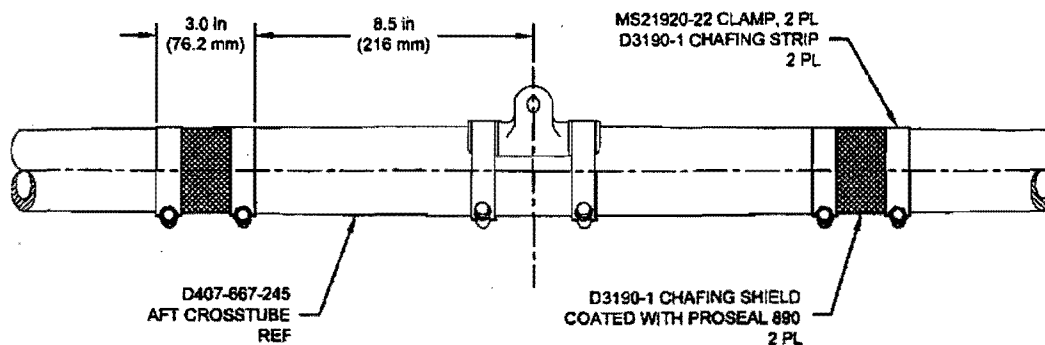
BY: 
D. SHEPHERD (DE # 02)

DATE: 11.04.07
CERT. NO.: SH01-5
ISSUE NO.: 3

A	NEW ISSUE	MB	11.04.07
REV.	DESCRIPTION	BY	DATE
DESIGN		DART AEROSPACE LTD	
DRAWN		HAWKESBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. A
MFG. APPR.		DSI 9550	SHEET 1 OF 2
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DE APPR.		D407-667-205 FINISHING CHANGE	NTS
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**FIGURE 1 - INSPECTION WINDOW ON
D407-667-205 CROSSTUBES**



**FIGURE 2 - CHAFING SHIELD
INSTALLATION ON D407-667-205**

CANADA
DEPARTMENT OF TRANSPORT
AIRCRAFT CERTIFICATION
BRANCH
DAO # 01-O-01

APPROVED
BY: *[Signature]*
D. SHEPHERD (DE # 02)

DATE: 11.04.07
CERT. NO.: SH01-5
ISSUE NO.: 3

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MFG. APPR.		DSI 9550	SHEET 2 OF 2
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ACUREN

RAPPORT D'INSPECTION PAR RESSUAGE

P- 12618

PAGE 1 DE 1

CLIENT DART AEROSPACE DATE 2011-04-05 HEURE 7:30 ☒ AM ☐ PM
 ATTENTION LINDA CHANTE N° TRAVAIL 188-11-02070
 ADRESSE 1270 ABERDEEN ST N° CLIENT PO/VO — 13801
HAWKESBURY, ONTARIO SITE DE TRAVAIL HAWKESBURY
 PROJET FPI ON 10 CROSSTUBE ACCEPTATION STD. ASTM E1417 / QSL-038 DATE/REV. 2005
 ITEM(S) EXAMINÉ

DESCRIPTION DES TRAVAUX N° PROCÉDURE LT-002 DATE/REV. 2008 N° TECHNIQUE LT-002 Fall-2 DATE/REV.
 N° ITEMS MATÉRIEL ALUM. 2024 ÉPAISSEUR VARIÉS
 DESCRIPTION wet Fluorescent Liquid Penetrant Inspection
CARRIED OUT ON 100% EXTERNAL SURFACE

DÉTAILS DES INSPECTIONS
 MÉTHODE : ☒ FLUORESCENT ☐ VISIBLE ☒ LAVABLE À L'EAU ☐ MÉTHODE DISSOLVANT ☐ PRÉ-ÉMULSIONNANT
 MARQUE : MAGNAFLU LUM. NOIRE S/N 6404273 PUISS. > 1 000 µ W/cm² ☐ AMBIANT < 2 fc
 PÉNÉTRANT : 2LG7 TEMPS PÉNÉTRATION MIN. 45 MIN. ÉQUIP. LUMIÈRE ☒ LAMP. POCHÉ ☐ LAMP. CULASSE ☐ PUISS. > 100 fc @ SURFACE
 DISSOLVANT PÉNÉTRANT H2O TEMPS SÉCHAGE MIN. >10 MIN. AUTRES
 RÉVÉLATEUR SDS2 TEMPS RÉVÉLATION MIN. 10 MIN. MÈTRE LUM. N/S DATE CAL DUE 07/19/2011
 TYPE RÉVÉLATEUR ☒ NON AQUEUX ☐ AQUEUX ☐ SEC 1898866

SURFACE INSPECTÉE
 CONDITION SURFACE ☐ MEULÉE ☐ SOUDÉE ☐ MACHINÉE ☐ MRENAILLÉE ☒ MÉTAL PROPRE
 TEMPÉRATURE SURFACE ☐ < - 4°C/20°F ☐ - 4°C/20°F A 10° C/50°F ☒ 10°C/50°F A 52°C/125°F ☐ > 52°C/125°F

RÉSULTATS (☐ MÉTRIQUE ☐ IMPÉRIALE)

ITEM	COMMENTAIRES	ACCEPTÉ	REJETÉ
1	CROSSTUBE WO 66346	✓	
1	CROSSTUBE WO 67211	✓	
1	CROSSTUBE WO 67210	✓	
1	CROSSTUBE WO 65700	✓	
1	CROSSTUBE WO 65699	✓	
1	CROSSTUBE WO 67868	✓	
1	CROSSTUBE WO 67869	✓	
1	CROSSTUBE WO 67439	✓	
1	CROSSTUBE WO 67440	✓	
1	CROSSTUBE WO 66345	✓	

Étendue des Services

L'entente selon laquelle le Groupe Acuren Inc. exécute les services ne concerne que les énoncés par écrit. En aucune circonstance ces services ne s'étendent au-delà de l'exécution des services demandés. Il est entendu que toutes les descriptions, les observations et les expressions d'opinions faites par Acuren reflètent les opinions ou les observations de l'entreprise fondées sur l'information et les hypothèses fournies par le propriétaire/opérateur, et elles ne constituent pas des déclarations ou des garanties ou ne peuvent être interprétées comme constituant. Le Groupe Acuren Inc. n'assume aucune des responsabilités du propriétaire/opérateur, et le propriétaire/opérateur conserve la responsabilité entière des décisions prises en matière d'ingénierie, de fabrication, de réparation et d'usage à partir de l'information ou des données fournies par Acuren en rapport avec les services décrits dans les présentes ne peuvent excéder le coût des services rendus.

Norme de Diligence

Dans l'exécution des services, le Groupe Acuren Inc. applique le degré de diligence, le soin et la compétence normalement exercés dans des circonstances semblables par d'autres fournisseurs de ce type de services opérant dans la même localité ou dans une localité similaire. Aucune autre garantie, implicite ou explicite, n'est faite ou voulue par le Groupe Acuren Inc.

SIGNATURES

REPRÉSENTANT Matthew Murdoch FTJ#:
 TECHNICIEN (SIGNATURE): David Repach MOULÉ SIGNATURE
 NOM (MOULÉ): David Repach 1^{er} TECHNICIEN 2nd TECHNICIEN
 ONGC NIVEAU 2 SNT NIVEAU _____ ONGC NIVEAU _____ SNT NIVEAU _____
 ONGC N° REGISTRATION _____ ONGC N° REGISTRATION _____

